

ABSTRACT OF THE INVENTION

A system and method for target identification are disclosed. In one embodiment, a light source emits a beam of electromagnetic radiation with a wavelength that is shorter than one millimeter. The beam is split by a beam splitter into a first portion and a second portion. The first portion is modulated by a first modulating device to form a first modulated portion. The second portion is modulated by a second modulating device to form a second modulated portion. The first and second modulating devices may each take the form of a single modulator. Alternately, the first and second modulating devices may each take the form of a plurality of modulators. The first and second modulated portions are combined by a beam combiner to form a hybrid beam. The hybrid beam is directed to an aperture, where it is radiated toward a reflective target. A reflected portion of the beam is reflected off the reflective target in the direction of the aperture. The reflected portion and background noise are collected by the aperture and directed to a receiver. The receiver determines information about the target by processing the received signal, which includes a difference signal, *i.e.*, a signal representing the difference between the first modulated portion and the second modulated portion. Because fluctuations and distortions due to source, atmosphere, and target are identically superimposed upon the first modulated portion and second modulated portion, these fluctuations and distortions will not appear in the difference signal. Thus, a high detection efficiency may be achieved.

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